

# PATENT SPECIFICATION COPY



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## COMPLETE SPECIFICATION.

### Improvements in or relating to Coil Springs.

I, FERNANDO CASABLANCAS, a Spanish Citizen, of Mina, 166, Sabadell (Province of Barcelona), Spain, Manufacturer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the manufacture of helical close coiled springs, especially suitable to work under tension and consists of an improvement introduced in the manufacture of such springs that prevents them from suffering detrimental deformation if they are submitted to very great stress.

It has previously been proposed to provide springs which operate under tension with means whereby excessive extension thereof can be limited. For example it has been proposed to provide a spring with a straight portion which is adapted to extend longitudinally through the spring and formed with a hooked end which acts as an abutment for the other end of the spring should the latter be placed under undue tension. Further it has been proposed to connect the ends of a spring by means of a chain or by a pair of link members to prevent undue expansion. With the prior constructions, however, one or both ends of the spring have been formed as loops or the like to serve as a means of connection.

According to the invention members of wire or the like are combined with a coiled spring by connecting both ends of the latter thereto, said members forming fixing hooks for the spring and being extended within said spring and interlocked with each other in such a manner that they act as buffers and limit the elongation of the said spring to a predetermined maximum whereby the spring cannot extend beyond this maximum and cannot suffer a permanent deformation and thereby lose its elastic characteristics. In one construction the members are bent and interlinked similarly to a pair of links of a chain and are prolonged by their free ends to form suitable fixing hooks. The interlinked portions of the members are enveloped by the cylindrical spirals which form the spring and which at each end of the spring taper to close upon the neck of the hooks portions of the interlinked members.

With this construction if the members are separated and exert a tension on each oppositely disposed hook, the members carry with them the spring and this will give way until the link part of the members come into contact when they will act as a stop and will not allow any further extension of the spring.

In the accompanying drawing is shown by way of example one form of springs made according to this invention. Figure 1 is a side view of the spring and, Figure 2 is a longitudinal section of the same.

As seen on the drawings, two members are used—10 and 20—preferably of thick wire or rod of a suitable material enclosed within a helical spring. The member—10—at one end being in the form of an elongated ring—11—and the other end of the wire being prolonged to form a hook—12. Likewise the other member—20—is similarly formed with an elongated ring—21—which is closed after having been inserted into the ring—11—of the other member, so that they form a joint like two links of a chain. The member 20 is also provided with a hook—22—at its end. Enveloping the members there is provided a helical spring—30—which has its ends closed firmly upon the necks of the members—10—and 20—so that both ends of the spring have a tapered shape. The members 10 and 20 constitute in effect two links of a chain having a certain amount of play relatively to each other and as they are held respectively by the ends of the spring, on separating the hooks or on exerting an opposite tension upon them the spring will give way until the moment when the two link portions come into contact thus acting as stop and preventing a further extension of the spring and its deformation above its critical point.

The same result might be obtained by fixing the members or hooks at the ends of the spring and linking them together

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through a short chain or any other device to limit the extension of the spring.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A spring arranged to operate by extension having combined therewith members of wire or the like by connecting both ends of the spring thereto said members forming fixing hooks and being extended within the spring, and interlocked with each other in such a manner that extension of the spring is allowed only to a predetermined extent and prevented from reaching an excessive extension and thereby being permanently deformed.

2. A spring according to claim 1,

wherein the parts of the members that enter the spring are connected by means of one or more links of a chain or any other suitable device to limit the extension of the spring.

3. The improvements in the manufacture of springs working by extension substantially as hereinbefore described with reference to the accompanying drawing.

4. The improved spring constructed; arranged and adapted to operate substantially as hereinbefore described with reference to the accompanying drawing.

Dated this 23rd day of May, 1932.

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FIG. 1.

FIG. 2.

[This Drawing is a full-size reproduction of the Original.]

